

CLAIMS

1           1.     A steady rest with independent vertical and horizontal adjustments,  
2     comprising:

3                     a base;

4                     an actuating member movable along a first axis toward a  
5     work piece position that is moveable either vertically or horizontally;

6                     a body slidably mounted on the base and having a first guide  
7     slot disposed at a first angle with respect to said first axis, and a second guide  
8     slot disposed at a second angle with respect to said first axis, and means  
9     connecting the body to the actuating member for movement along said first axis;

10                    a first arm slidably movable in the first guide slot along a  
11     linear path of motion between a clamping position, and a release position [along  
12     a second path of motion between a clamping position and a release position];

13                    a second arm slidably movable in the second guide slot  
14     along a second path of motion between a clamping position and a release  
15     position;

16                    a first workpiece gripping member pivotally mounted on the  
17     first arm;

18                    a second workpiece gripping member pivotally mounted on  
19     the second arm;

20                    a third workpiece gripping member mounted on the body, so  
21     as to be moveable therewith;

22                    a first gripping pad pivotally mounted on the first arm;

23 a second gripping pad spaced from the first gripping pad and  
24 pivotally mounted on the second arm;

25 a third gripping pad mounted on the body;

26 the actuating member being connected to the first arm for  
27 movement in a first stroke, and the second arm for movement in a second stroke  
28 along their respective paths of motion;

29 cam means disposed between the actuating member and the  
30 first arm and the second arm for moving the first arm and the second arm toward  
31 their respective clamping positions as [on] the actuating member is moved in a  
32 first direction, and for moving the first arm and the second arm toward their  
33 respective release positions as the cam member is moved [movable] in a reverse  
34 direction;

35 whereby a rotating workpiece may be gripped between the  
36 first, the second and the third gripping [new] pads in which the axis of rotation of  
37 the workpiece is in said [a] first workpiece position;

38 the body having a first camming opening, and a second  
39 camming opening spaced from the first camming opening;

40 a first camming plate slidably mounted in the first camming  
41 opening for movement in a direction normal to said first axis, as the actuating  
42 member moves the body along said first axis;

43 a second camming plate slidably mounted in the second  
44 camming slot for movement in a direction normal to said first axis, as the  
45 actuating member moves the body along said first axis;

46                   the first camming plate having a third camming opening;  
47                   the second camming plate having a fourth camming  
48 opening;  
49                   a first camming structure carried on the first arm and  
50 received in the third camming slot so as to be movable in a first camming motion  
51 as the actuating member is moving the body along said first axis;  
52                   first adjusting structure mounted on the body and connected  
53 to the first camming plate to adjust the path of motion of the first arm either  
54 horizontally or vertically;  
55                   a second camming structure carried on the second arm and  
56 received in the fourth camming slot so as to be movable in a second path of  
57 motion as the actuating member is moving the body along said first axis; and  
58                   second adjusting structure mounted on the body and  
59 connected to the second camming plate to adjust the path of motion of the  
60 second arm either horizontally or vertically.

1           2.     A steady rest as defined in claim 1, and in which the actuating  
2 member applies a constant bias on the first arm and the second arm in their  
3 respective clamping positions.

1           3.     A steady rest as defined in claim 1 in which the first and second  
2 adjusting structures are threaded members threadably mounted on the body.

1           4.     A steady rest as defined in claim 1, and in which the actuating  
2     member is hydraulically actuated.

1           5.     In a workpiece gripping apparatus, a combination comprising:  
2                     a base;  
3                     a body slidably mounted on the base;  
4                     a first clamping arm slidably mounted on the base along a  
5     first linear path of motion between a clamping position, and a release position;  
6                     a second clamping arm slidably mounted on the base  
7     adjacent the first clamping arm along a second linear path of motion parallel to  
8     the first path of motion of the first clamping arm, between a clamping position,  
9     and a release position;  
10                    the first clamping arm [bar] having a camming slot disposed  
11     at an acute angle with respect to the linear path of motion of the first clamping  
12     arm [bar];  
13                    the second clamping arm [bar] having a camming slot  
14     disposed at an acute angle with respect to the linear path of motion of the second  
15     clamping arm [bar];  
16                    actuator means connected to the first arm and the second  
17     arm and means supporting the actuator means for movement along an axis [and]  
18     either toward a workpiece position or away from the workpiece position;  
19                    a camming means disposed in the body and connected  
20     [convention] between the actuator means [member] and the first arm and the

21 second arm for moving them [then] along their respective linear paths of motion  
22 toward their respective clamping positions as the camming means is moved in an  
23 actuating motion, and for moving the clamping arms [bars] toward their  
24 respective release positions as the camming means is moved in a reverse  
25 motion; and

26 a first workpiece gripping member pivotally mounted on the  
27 first clamping arm, and a second workpiece gripping member mounted on the  
28 second clamping arm for engaging a rotatable workpiece as the clamping arms  
29 are urged toward their respective clamping positions.

1 6. A steady rest apparatus as defined in claim 1, in which the  
2 workpiece gripping members each comprise a wear pad.

1 7. A steady rest as defined in claim 1, in which the first workpiece  
2 gripping member is spaced from the second workpiece gripping member, and the  
3 first and the second workpiece gripping members are disposed on opposite sides  
4 of the axis of rotation of the workpiece.

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- 1           8.     A steady rest as defined in claim 1, including a piston and cylinder
- 2     actuator for moving the third clamping arm [member] toward or away from the
- 3     workpiece.